



**IDAHO**  
Water Resource Board

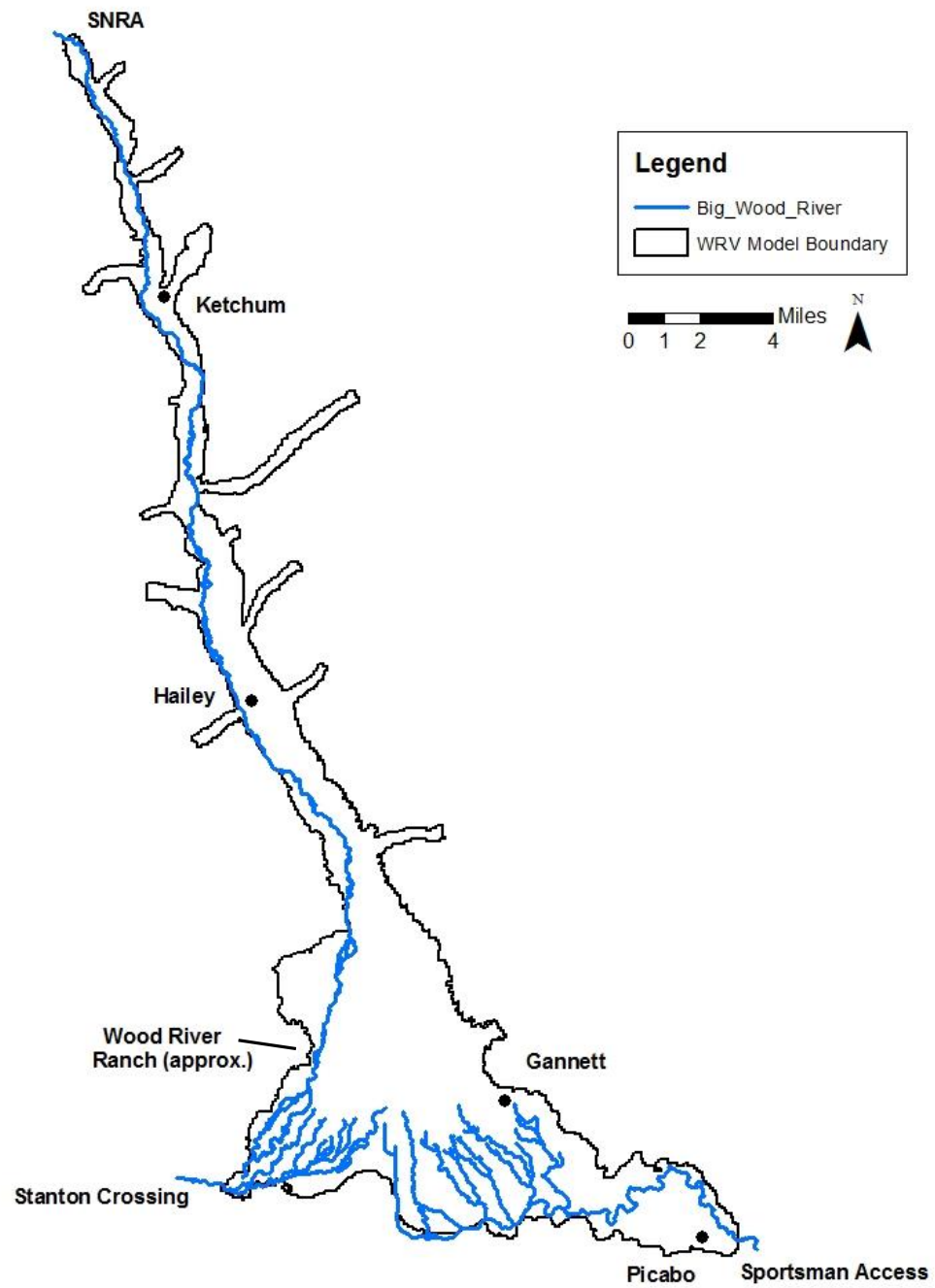


# Wood River Recharge Potential

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Presented by Mike McVay, P.E., P.G.

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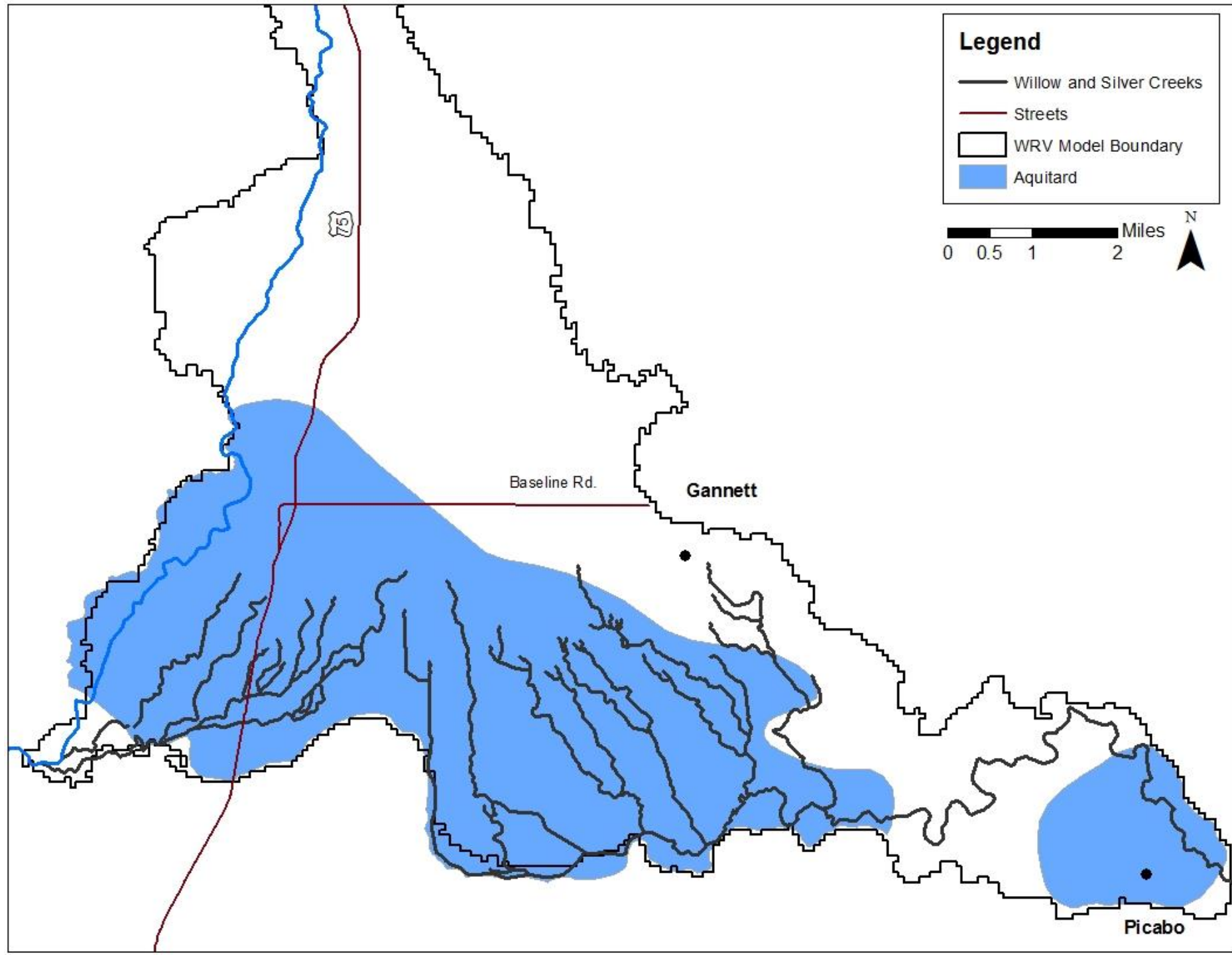
## Wood River Valley Hydrogeology Primer

### Aquifer

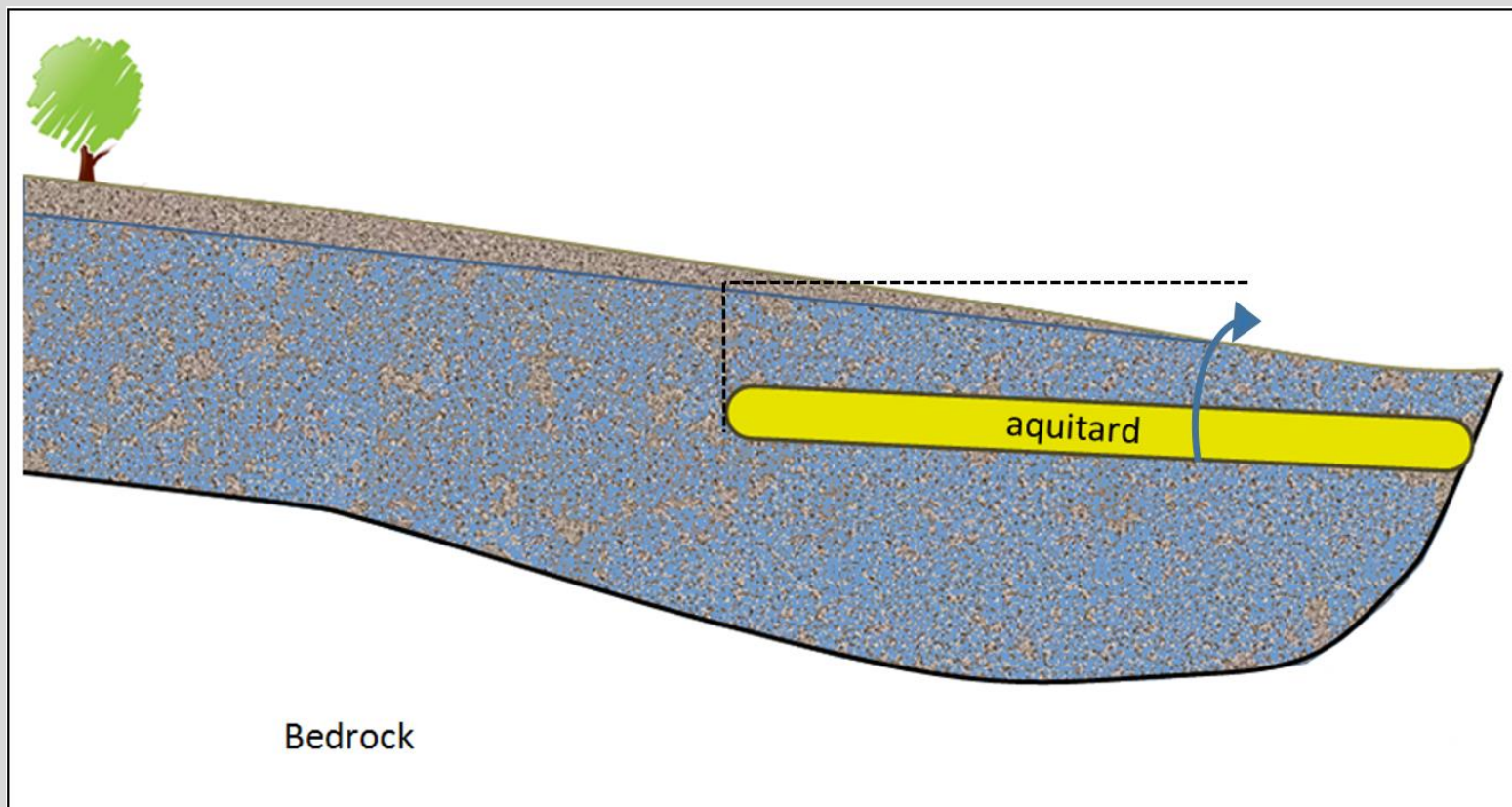
- Generally composed of coarse-grained sediments.
- Aquifer is generally unconfined.
- Confining layer (series of layers) in southern half of Bellevue Triangle composed of fine-grained material.
- Confined aquifer exists in the southern half of the Bellevue Triangle due to confining layer.

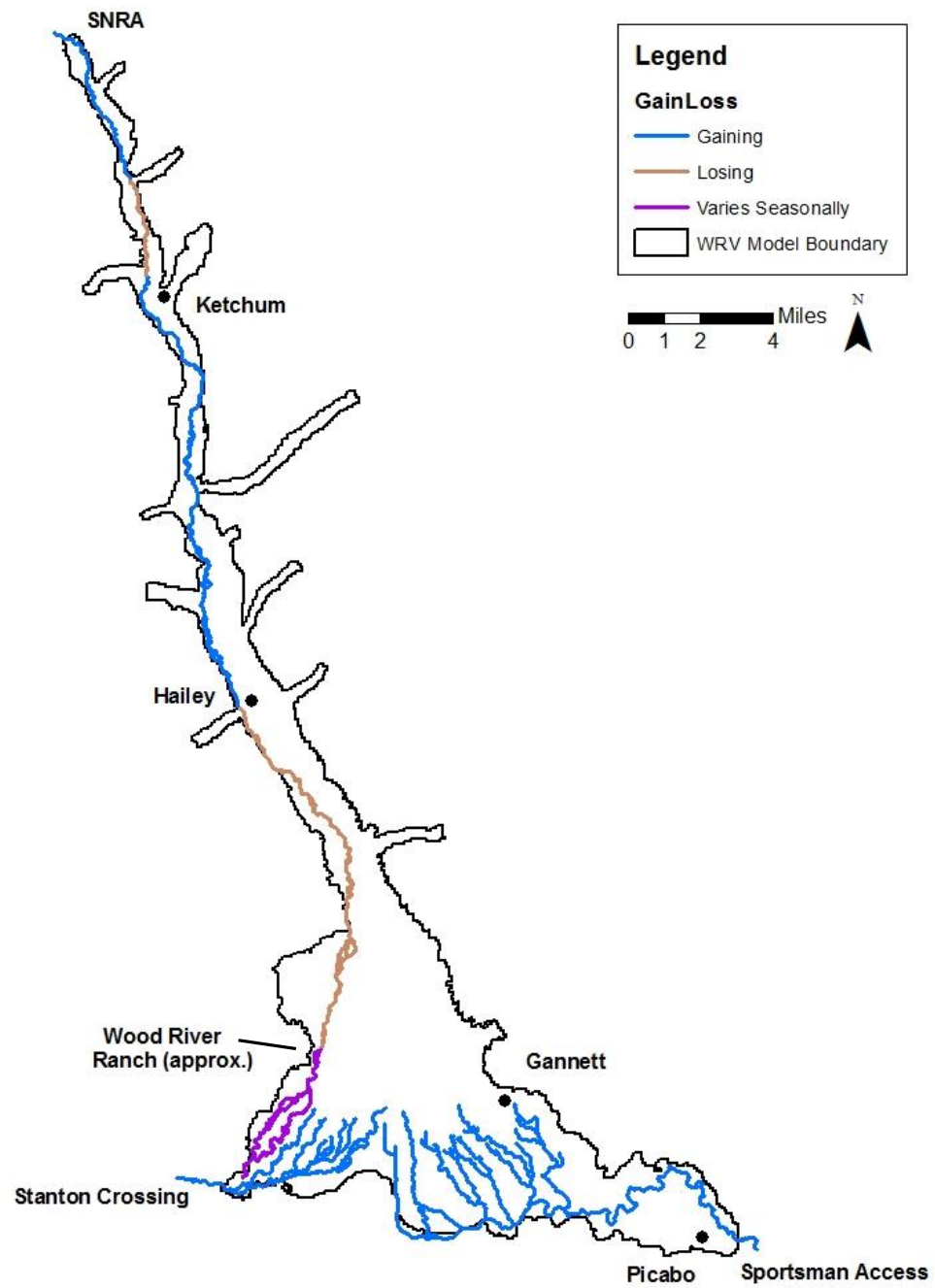
### Groundwater-Surface Water

- Big Wood River generally gains water from the aquifer north of Hailey.
- Big Wood River loses water to the aquifer from Hailey to approx. Wood River Ranch.
- Groundwater discharges to Big Wood River, Willow Creek, and Silver Creek south of Baseline Road.
- Negligible underflow at Stanton Crossing. Silver Creek underflow  $\approx 6,000$  AF/yr.









## ESPA Comparison

- The ESPA is the flagship recharge project for the State.
- Most of our experience, and expectations have come from ESPA recharge efforts.

## Legend

- ESPAM Model Area
- Wood River Model Area

**Surface Area**  
59,900 acres

**Surface Area**  
7,191,000 acres

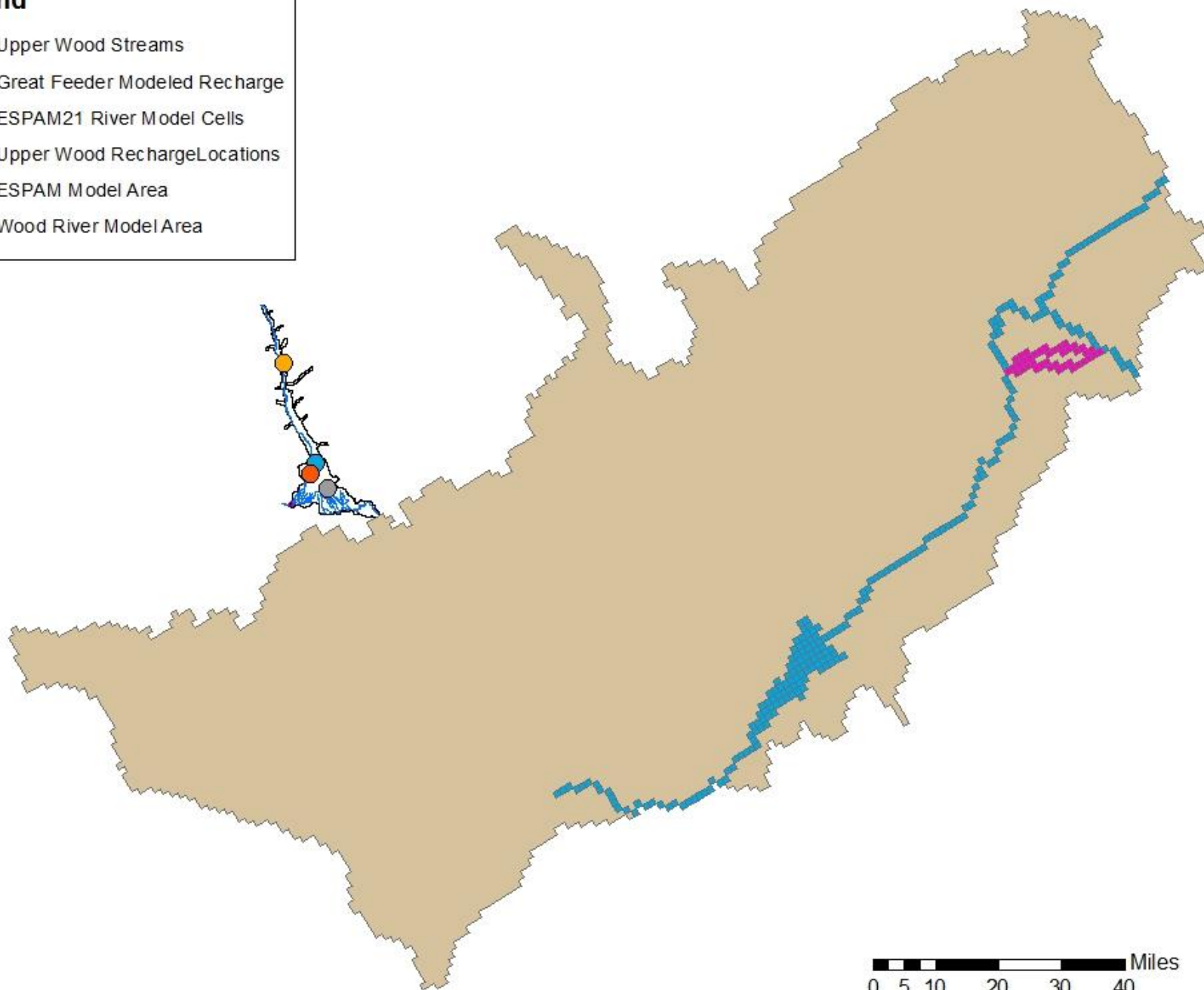
0 5 10 20 30 40 Miles



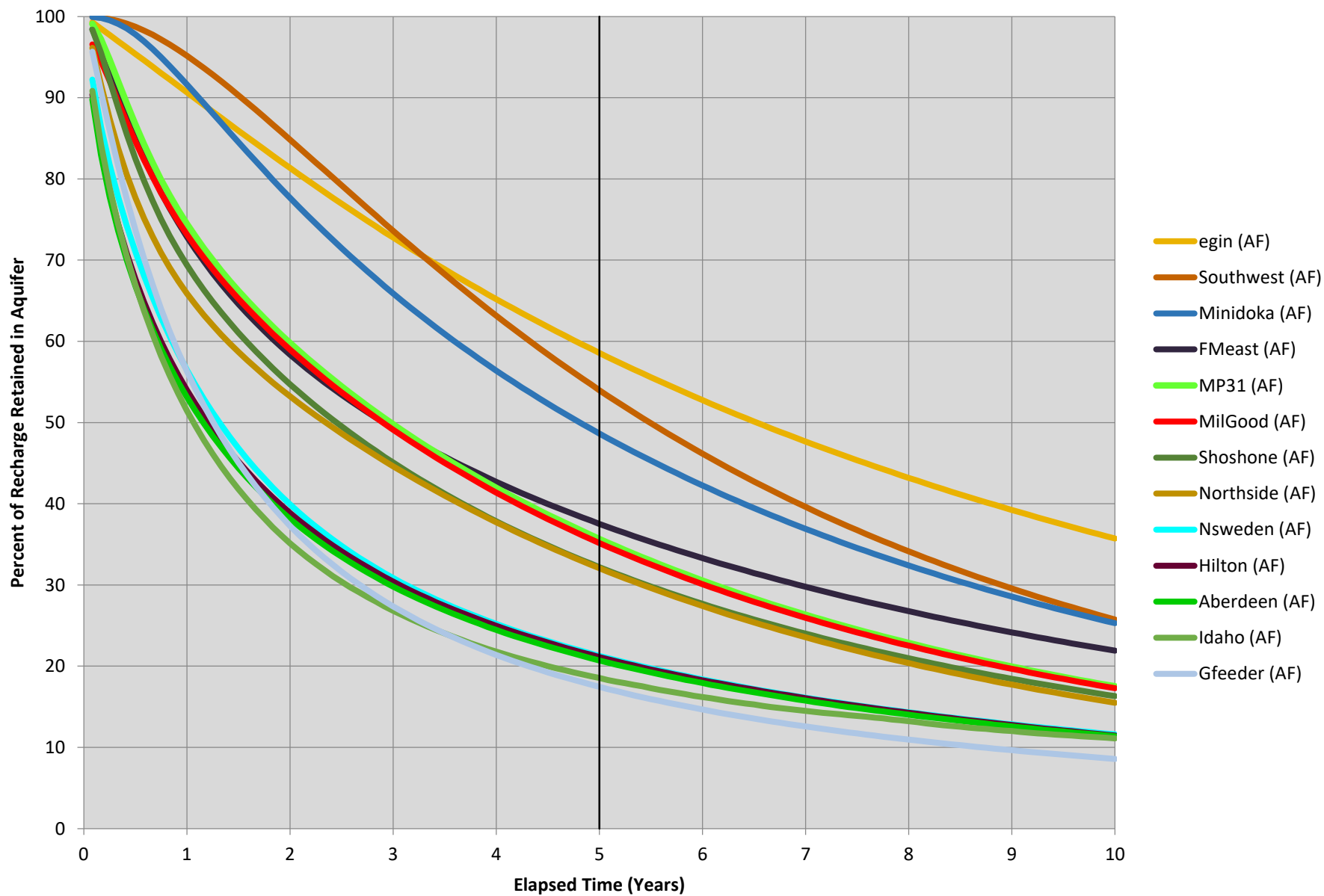


## Legend

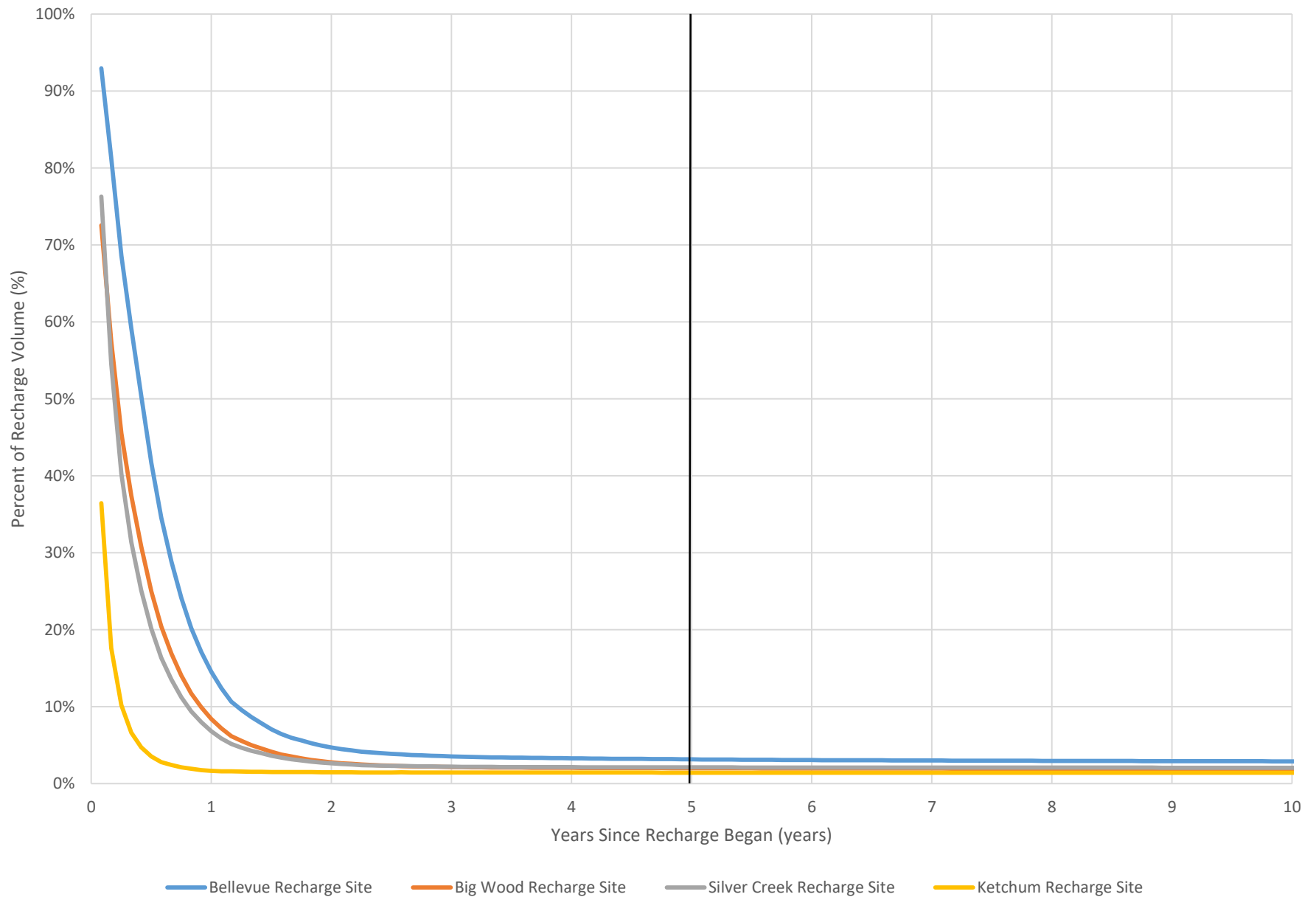
- Upper Wood Streams
- Great Feeder Modeled Recharge
- ESPAM21 River Model Cells
- Upper Wood RechargeLocations
- ESPAM Model Area
- Wood River Model Area

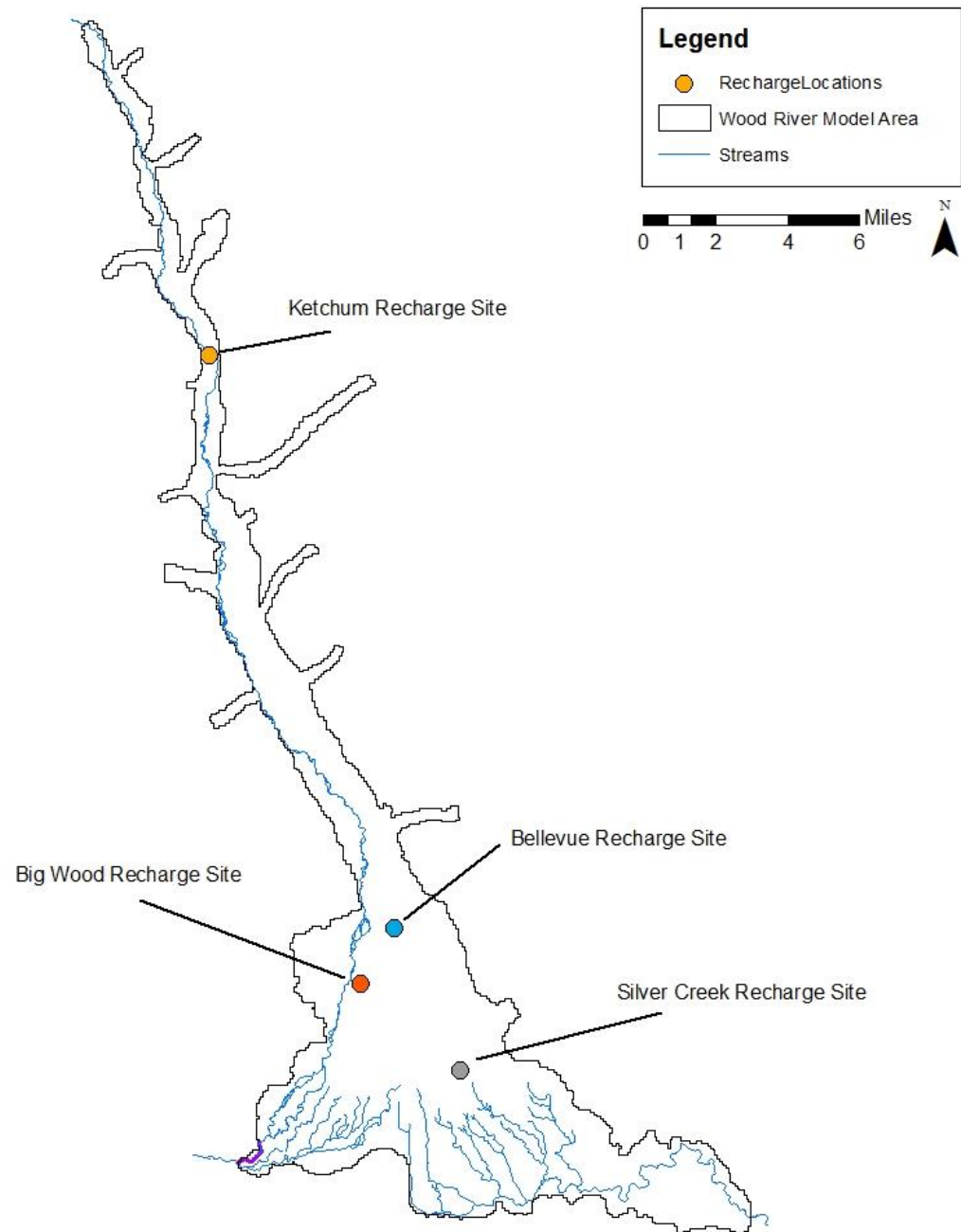


## Retention of Recharged Water within the ESPA



## Retention of Recharged Water within Big Wood Aquifer

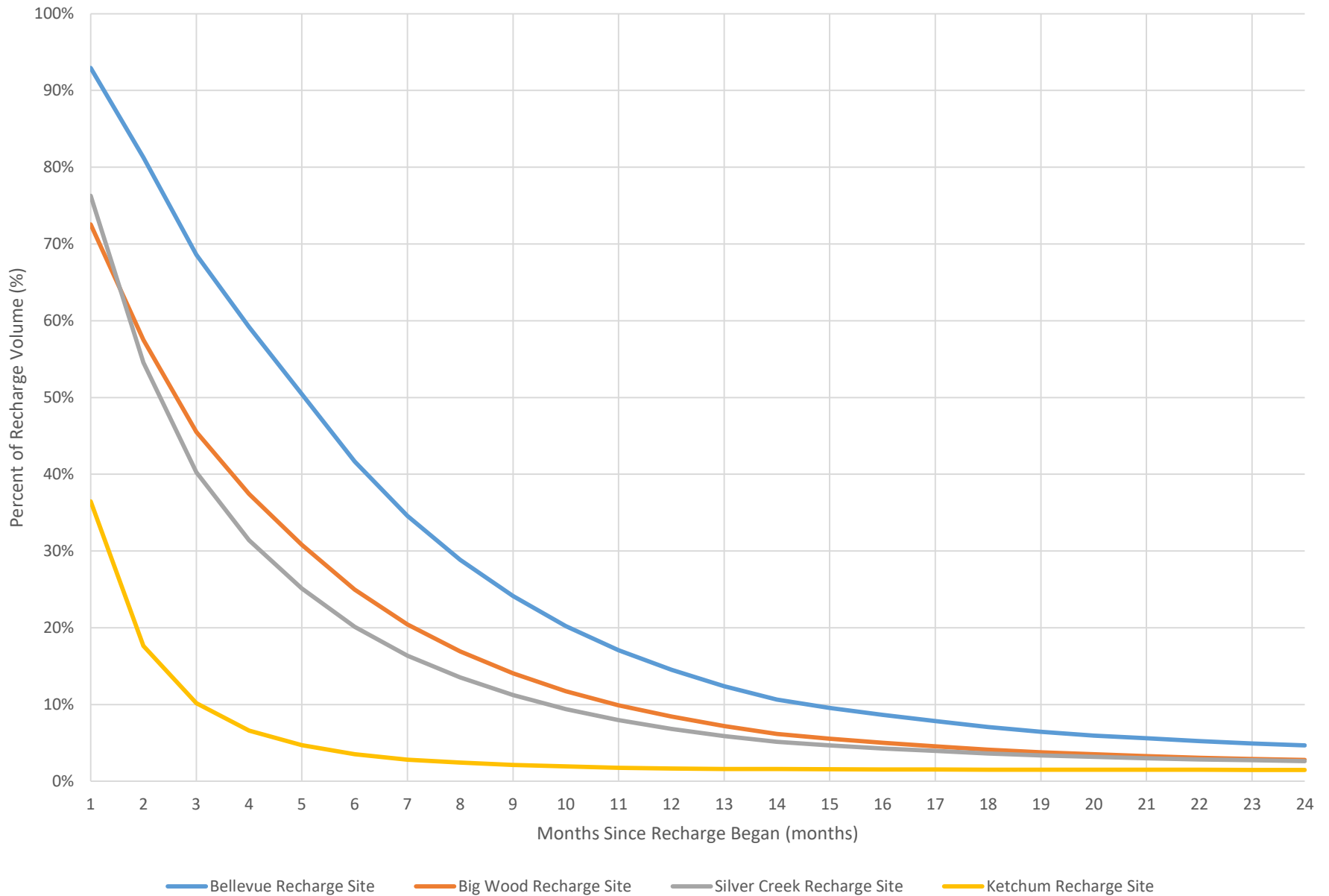




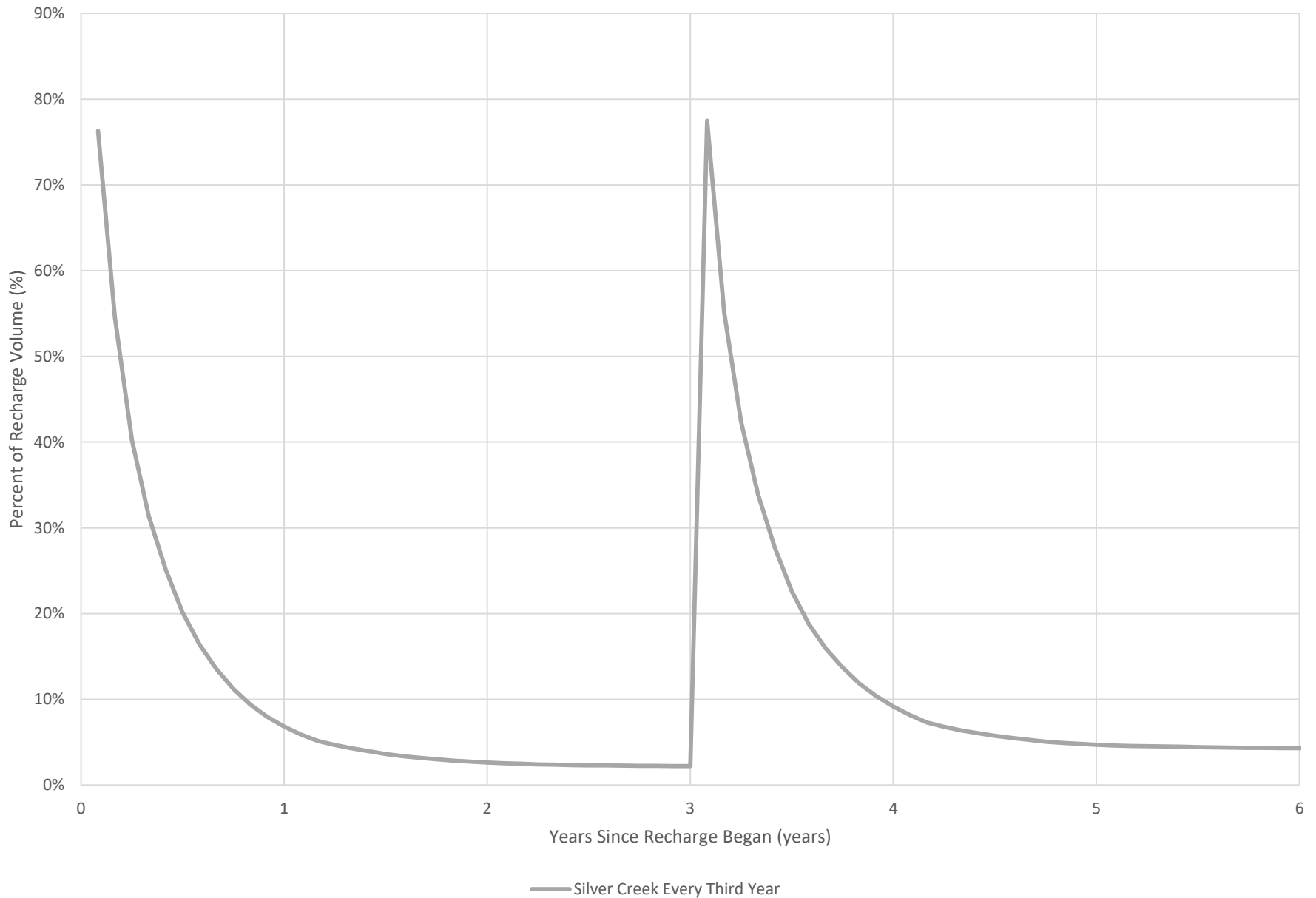
# Aquifer Storage Impacts



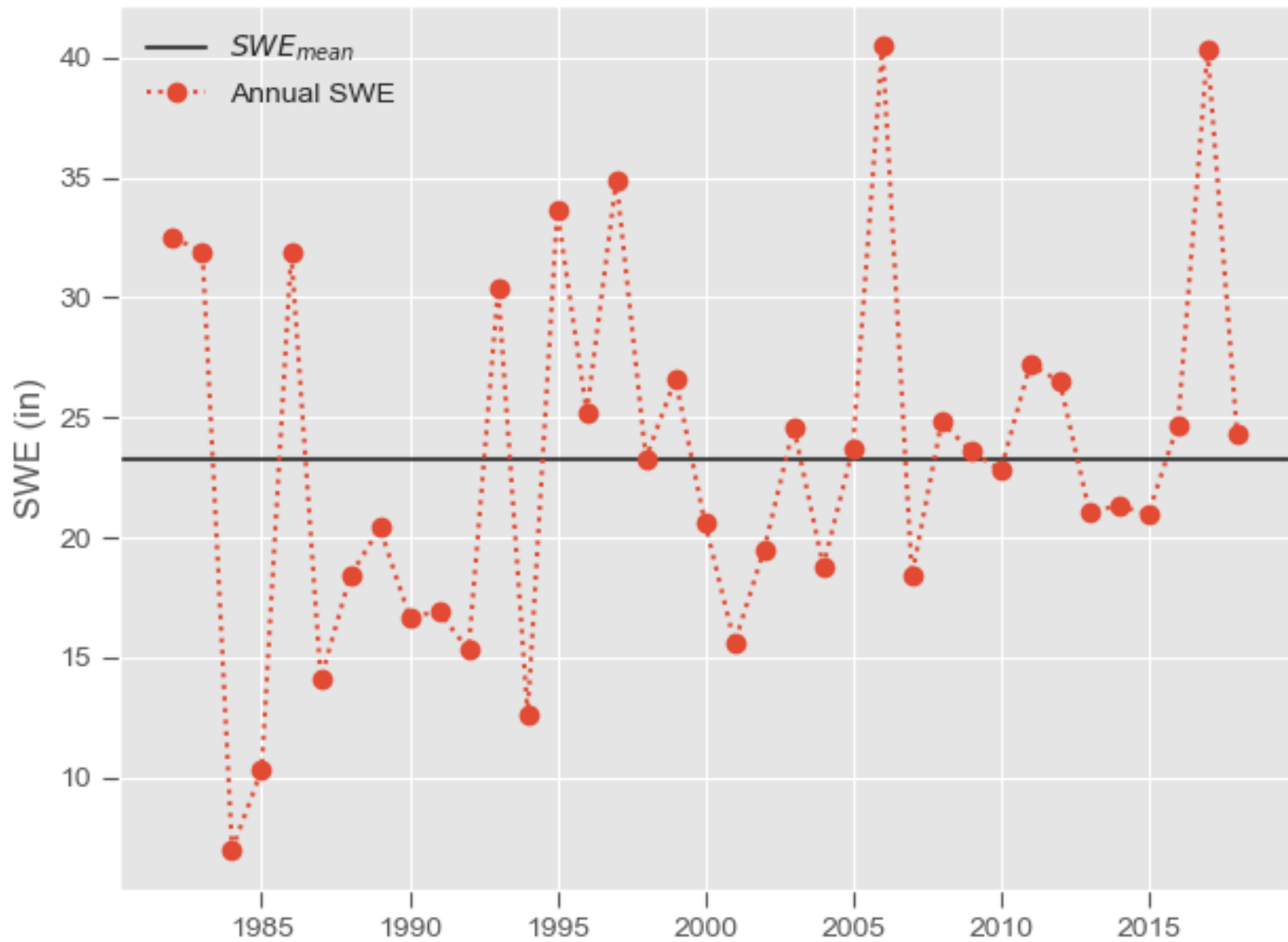
## Retention of Recharged Water within Big Wood Aquifer



# Retention of Recharged Water within Big Wood Aquifer (Silver Creek Site)



# Galena Summit



## Aquifer Storage Impacts due to Recharge

### Recharge Benefits

- Moderate percentage of recharge water remains in storage for a few months.
- Residence time may benefit users during the same season as recharge.
- Recharge may improve water quality.

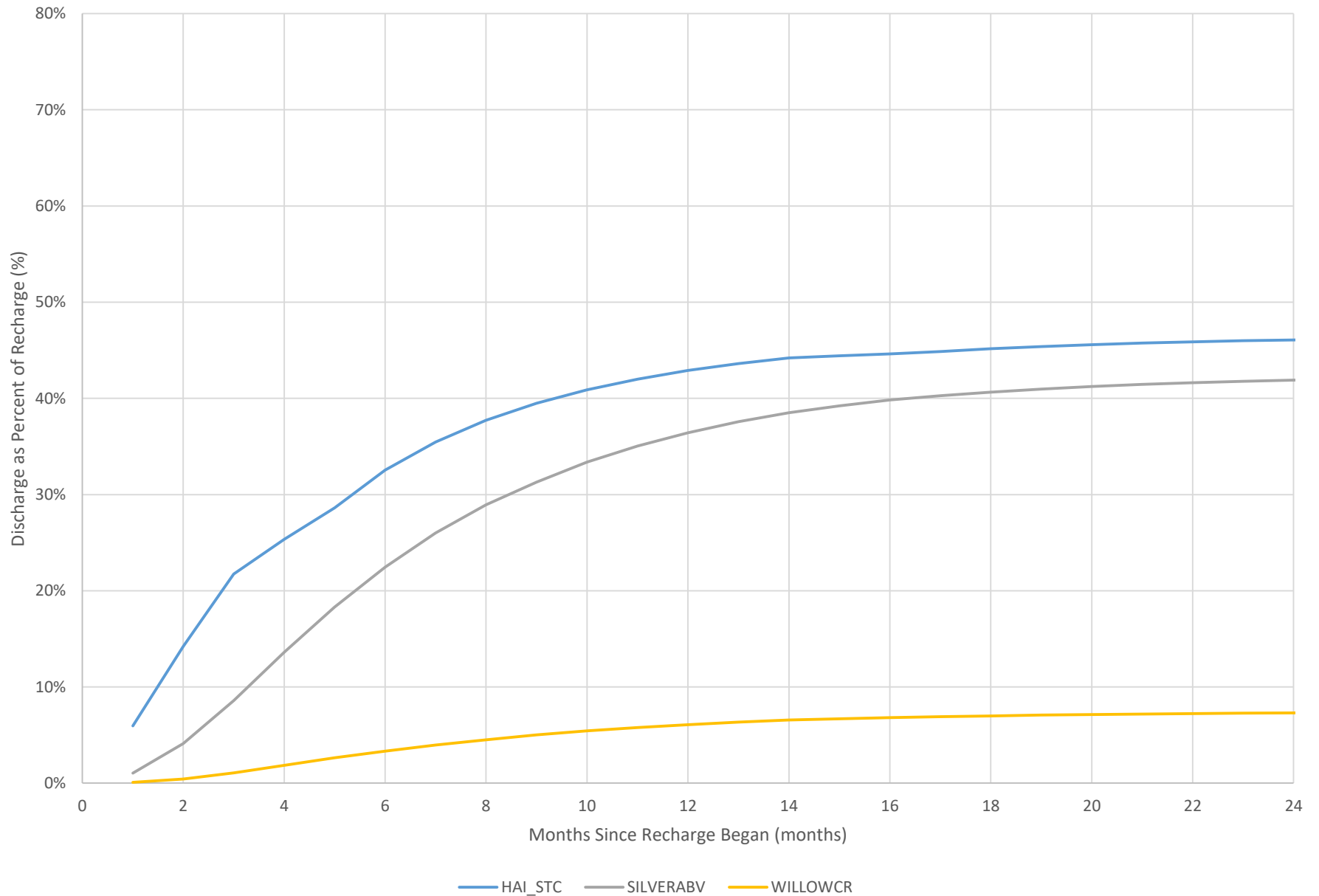
### Recharge Limitations

- Aquifer-enhancement benefits are dependent on new water (Magic is full, consumptive-use reduction).
- Recharge during wet years does not provide significant aquifer-enhancement benefits during subsequent dry years.

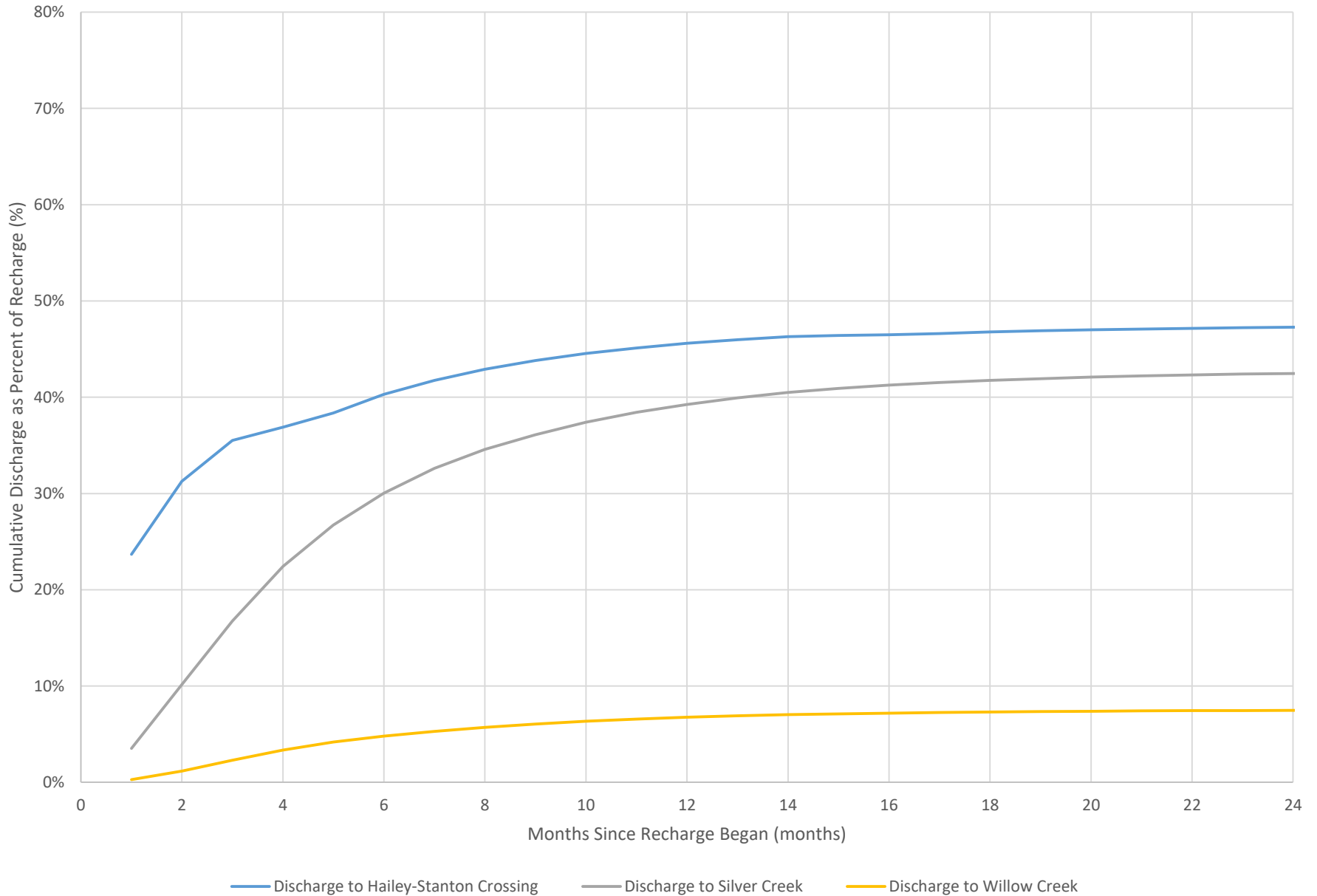
# Surface Water Impacts



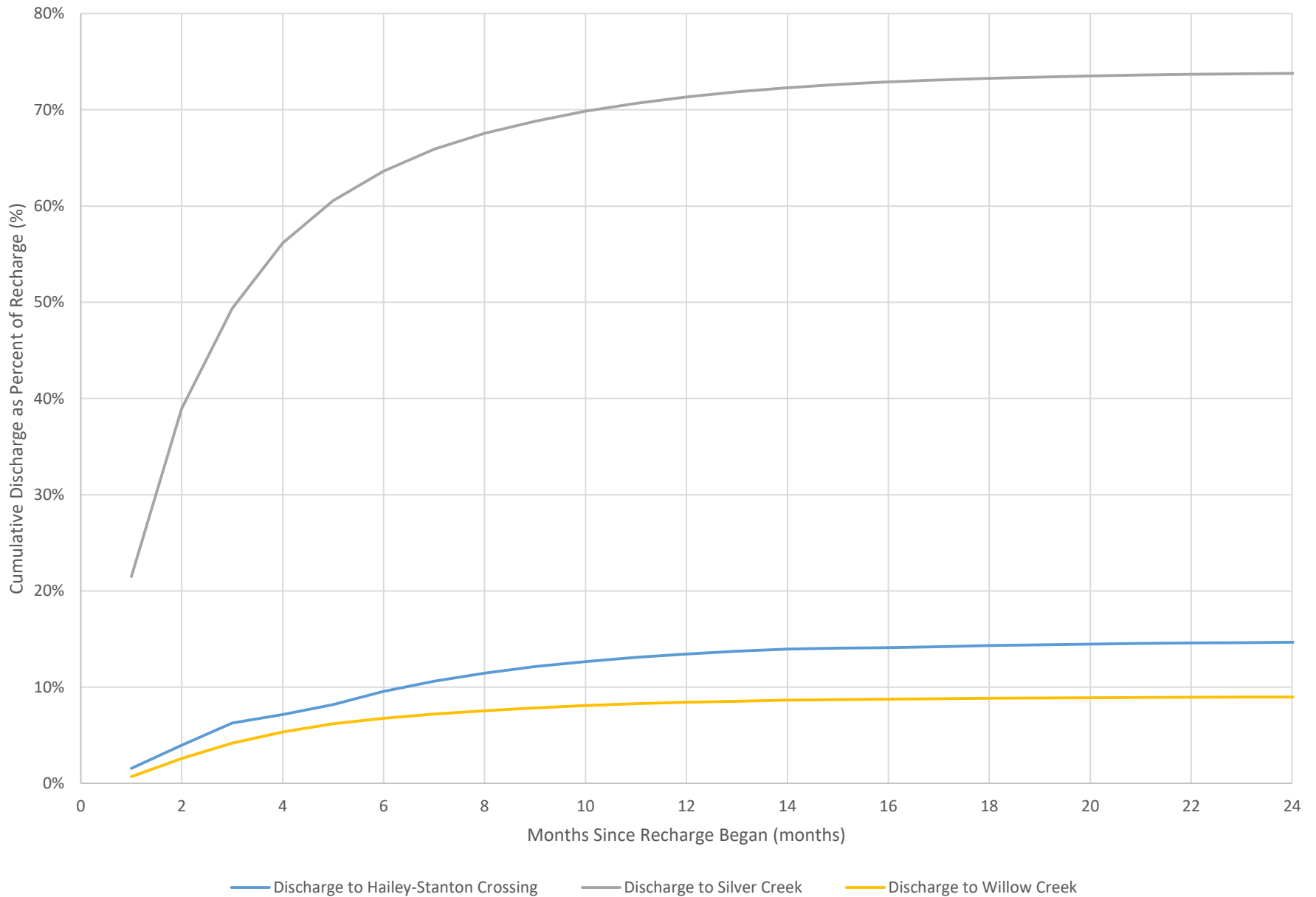
## Discharge to Surface Water: Bellevue Recharge Site



## Discharge to Surface Water: Big Wood Recharge Site



## Discharge to Surface Water: Silver Creek Recharge Site



## Impacts due to Recharge Location

- Moving recharge from the Big Wood site to the Silver Creek site moves approximately 30% of the recharge volume from Big Wood discharge to Silver Creek discharge.

# Surface Water Impacts due to Recharge

## Recharge Benefits

- Recharge can be used to direct a percentage of the streamflow toward either the Sportsman's Access or Stanton Crossing basin discharge areas.
- Recharge with new water can increase surface water discharge out-of-basin during the same season as recharge.
- Changes in discharge location may benefit downstream users during the same season as recharge.
- Changes in discharge location may benefit upper basin users during the same season as recharge.

## Recharge Limitations

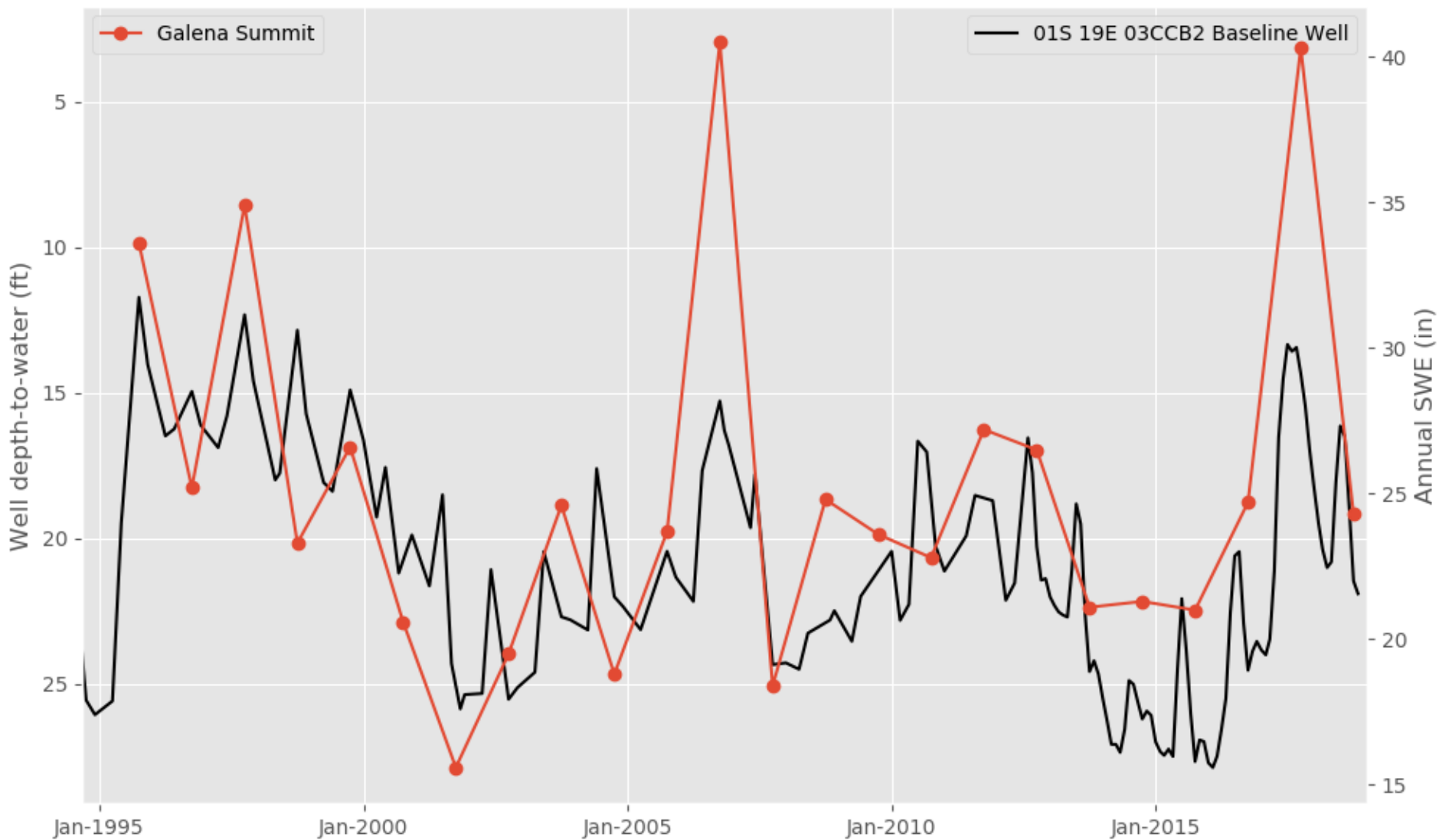
- Increased total streamflow benefits are dependent on new water.
- Recharge during wet years does not enhance streamflow in subsequent dry years.
- Changes in discharge location may harm downstream or upper basin users during the same season as recharge.
  - May impact ESPA recharge.
- Increased streamflow to the ESPA may result in more consumptive use.



## Summary of Wood River Recharge Potential

- This is a small aquifer.
- Aquifer retention lasts for a few months.
- Benefits occur during the same season as recharge.
- Recharge during wet years does not provide aquifer-enhancement benefits during subsequent dry years.
- Recharge can be used to steer some discharge between Silver Creek and Willow Creek/Big Wood River.
- Aquifer stabilization and benefits to downstream users are dependent on new water.
- Recharge may result in more consumptive use on the ESPA.
- Recharge in the Wood River basin may interfere with ESPA recharge (analysis needed).

# Groundwater levels track snowpack



Questions?

Average Monthly Silver Creek at Sportsman Access (cfs)

